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(54) Title: SPORTING EVENT OPTIONS MARKET TRADING GAME
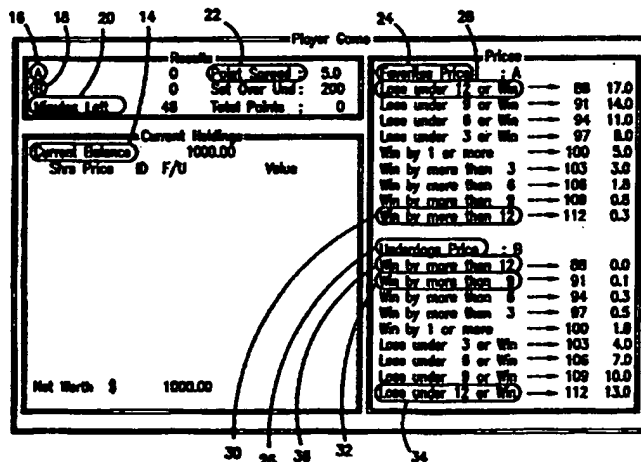
(57) Abstract

A commodities option trading game is provided in which the simulated market, which determines whether the value of the simulated commodities options rise or fall, is determined by a real event occurring outside the game being played. In a preferred embodiment, the event from which the simulated market is derived is a real life sporting event, such as a professional basketball, football, or baseball game. Preferably a host calculator or computer (10) generates the initial option prices and displays the information to a plurality of player stations (12). After play begins, the host computer updates the options prices (24, 26) using formulae based on the current score (16, 18), time remaining (20), and other empirically determined factors. The players buy and sell options in response to the momentum of the market. At the conclusion of the sporting event, the options are cashed in for their intrinsic value and the player with the most accumulated wealth is declared the winner.

SPORTING EVENT OPTIONS MARKET TRADING GAME

Background of the Invention

This invention relates to games, particularly to options market trading games. An option, of the type traded
5 in a commodities market, is nothing more than a right (either to buy or sell) a particular commodity at a fixed price (called the settlement or "strike" price) at some time in the future. A call option is the right to buy the commodity in the future. A put option is the right to sell
10 the commodity in the future. An option holder is the person who owns the right conveyed by the option. The option writer is the person who will have to perform (e.g. buy or sell at the fixed price) in accordance with the right granted by the option.

15 The intrinsic (or cash settlement) value of an option is equal to the difference between the settlement price of the option and the market value of the commodity. For example, a call option with a settlement price of $50 has an intrinsic value of $10 if the value of the commodity is
20 currently $60, because the holder of the option could theoretically force the writer of the option to deliver $60 worth of the commodity for $50. Similarly, a put option with a settlement price of $50 has an intrinsic value of $10 if value of the commodity is currently $40, because the
25 option holder could theoretically force the writer of the option to buy $40 worth of the commodity for $50. It is important to note that the intrinsic value of the option represents only the difference between the strike price and the current value of the commodity and does not reflect the
30 price of the commodity itself. Thus a put option with a settlement price of $500 would still have an intrinsic value of only $10 if the value of the commodity was currently $490.

Options also have "time value," that is, options
35 generally trade at some premium over their intrinsic value

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as dictated by market forces. The amount of the time value
premium depends on a multitude of factors including the
remaining life of the option (all options expire at some
point in time) and the volatility of the particular

5   commodity. For example, if the value of a commodity is
currently $60, a call option with a settlement value of $50
has an intrinsic value of $10, but may trade at $12 in the
open market. The $2 premium reflects the time value of the
option.

10   The field is replete with various stock market and
options market trading games. United States Patent No.
5,139,269 to Peterson, discloses a board game in which a
token is advanced around a board based on a roll of the
dice. The market events that determine whether the player

15   will realize a profit or loss are based upon the position of
the tokens on the board and/or subsequent rolls of the dice.
United States Patent No. 4,378,942 to Isaac discloses a game
in which the players buy and sell options with a "broker"
for a predetermined period, after which the market events

20   that determine whether the player will realize a profit or
loss are determined by randomly drawn cards and tokens.
United States Patent No. 4,948,145 to Breslow discloses a
game in which the market events are determined by spinning a
spinner. In all of the prior art games, however, the market

25   events are purely random, and therefore, the games lack a
certain realism that would be inherent if the market events
were determined by a real event.

It is a principal object of the present invention
to provide an options trading game with enhanced realism,

30   specifically to provide an options trading game in which the
market events are determined by a real event occurring
outside the game being played.

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Summary of the Invention

The present invention comprises an options trading game
in which the simulated market, which determines whether the
value of a commodities option rises or falls, is determined
5   by a real event occurring outside the game being played. In
a preferred embodiment, the event from which the simulated
market is derived is a real-life contest, preferably a
sporting event, such as a professional basketball, football,
or baseball game. Preferably a host calculator or computer
10   generates the initial option prices. This "host" computer
then provides the information to a plurality of player
stations, which could be additional computers, "dumb"
terminals, television sets (or a portion thereof), or other
conventional display means (hereinafter referred to as
15   player "terminals"). At the beginning of play, each player
is given a predetermined number of units (dollars) to spend
on options. In a preferred embodiment, the host computer
permits trading to take place before the beginning of the
sporting event, during time outs, and during other breaks in
20   the action, thus enabling the players to buy and sell their
options throughout the event, yet still enjoy viewing the
sporting event. However, continuous trading throughout the
sporting event is also within the scope of the present
invention. After play begins, the host computer updates the
25   options prices using formulae based on the current score (as
used herein, "score" means points scored by each team, total
points scored by all teams, lead time between any two
competitors in a race, number of hits, number of errors,
shots on goal, or any other quantifiable representation of
30   the progress of a contest), together with such parameters
as, time remaining (or in the case of baseball, innings
remaining), and a variety of other empirically determined
factors, such as field position, downs remaining, yards to a
first down, runners on base, balls and strikes, and number
35   of outs. At the conclusion of the sporting event, the

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options are cashed in for their intrinsic value (i.e. their
cash settlement value) and the player with the most
accumulated wealth is declared the winner. Since, according
to the present invention, the prices of the options

5   fluctuate in response to the momentum of the sporting event,
rather than in response to a purely random input, the game
of the present invention adds a realism that cannot be
achieved by a game that simulates the market by purely
random means.

10   Brief Description of the Drawings

The above and other objects, aspects, features and
attendant advantages of the present invention will become
apparent from a consideration of the ensuing detailed
description of presently preferred embodiments and methods

15   thereof, taken in conjunction with the accompanying
drawings, in which:

FIG. 1 is an illustration of a host computer and a
network of player terminals according to an embodiment of
the present invention.

20   FIG. 2 is an illustration of a player terminal screen
at the beginning of a game played according to an embodiment
of the present invention.

FIG. 3 is a summary of formulae for calculating the
simulated "favorite" commodities options prices of FIG. 2

25   and the results.

FIG. 4 is a summary of formulae for calculating the
simulated "underdog" commodities options prices of FIG. 2
and the results.

FIG. 5 is an illustration of the player terminal screen

30   according to the embodiment of FIG. 2 at a point in time
during the sporting event.

FIG. 6 is a summary of formulae for calculating the
simulated "favorite" commodities options prices of FIG. 5
and the results.

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FIG. 7 is a summary of formulae for calculating the simulated "underdog" commodities options prices of FIG. 5 and the results.

FIG. 8 is an illustration of a player terminal screen at the beginning of a game played according to a second embodiment of the present invention.

FIG. 9 is a summary of formulae for calculating the simulated "over" commodities options prices of FIG. 8 and the results.

FIG. 10 is a summary of formulae for calculating the simulated "under" commodities options prices of FIG. 8 and the results.

FIG. 11 is an illustration of the player terminal screen according to the embodiment of FIG. 8 at a point in time during the sporting event.

FIG. 12 is a summary of formulae for calculating the simulated "over" commodities options prices of FIG. 11 and the results.

FIG. 13 is a summary of formulae for calculating the simulated "under" commodities options prices of FIG. 11 and the results.

FIG. 14 is an illustration of a player terminal screen at the end of a game played according to the embodiment of the present invention of FIGs. 2-7.

FIG. 15 is an illustration of a player terminal screen at the end of a game played according to the embodiment of the present invention of FIGs 8-13.

Description of Preferred Embodiments and Methods

The present invention comprises an options trading game in which the game's simulated market moves in response to occurrences in a real life event happening outside the game, such as in a sporting event. As shown in FIG. 1, in a preferred embodiment, a "host" calculator or computer 10 generates the options prices. This host computer then

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provides the information to a plurality of player computers
or terminals **12** via Local Area Network, Wide Area Network,
or other computer networks such as are well known in the
computer field.

5   FIG. 2 is an exemplary player's terminal display. At
the beginning of play, each player is given a predetermined
number of units (dollars) to spend on options, for example,
$1,000 as shown at reference **14** of FIG. 2. In the
embodiment of the present invention shown in FIG. 2, the

10   sporting event used to simulate the market is a basketball
game between team A **16** which is a 5 point favorite over team
B **18**. The sporting event has not yet commenced.
Accordingly, the time remaining **20** is 48 minutes (the total
time of a regulation basketball game). Referring to the

15   favorite's price column **24** the player learns that team A is
the favorite and that team B is the underdog as indicated in
the underdog's price column **26**. Referring to the point
spread **22** the player learns that the favorite is favored to
win by a 5 point spread.

20   The favorite's options available for purchase as
indicated in FIG. 2 range from an option on the favorite
doing no worse than losing by 11 points (*i.e.* "lose under 12
or win") **28** to an option on the favorite winning by at least
13 (*i.e.* "win by more than 12") **30**. The "lose under 12 or

25   win" option has a strike price of $88 and a trading value
(intrinsic value plus time value) of $17. The "win by more
than 12" option has a strike price of $112 and a trading
value of $.30. Since team A is the favorite, it is highly
likely that team A will do no worse than losing by 11

30   points. Accordingly, the "lose under 12 or win" option has
a high price. Similarly, because team A is only favored to
win by 5 points, it is moderately unlikely that team A will
actually win by more than 12. Accordingly, the "win by more
than 12" option is fairly inexpensive.

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Similarly, the underdog's options range from an option
that the underdog will win by at least 10 (i.e. "win by more
than 9") 32 to an option that the underdog will lose by less
than 12 (i.e. "lose under 12 or win") 34 at the strike
5   prices and trading values indicated. The apparent option
that the underdog will win by at least 13 (i.e. "win by more
than 12") 36 having an apparent strike price of $88 is
actually out-of-range as indicated by a trading price of
$0.0. Options having a price of $0.0 cannot be purchased.
10   As with the favorite's options, since the underdog is only a
5 point underdog, it is highly probable that it will not
lose by more than 12. Accordingly, this option has a high
trading price. Similarly, the probability that the underdog
would win by more than 9 is quite low and, therefore, the
15   price for this option is also quite low.

The strike prices appearing in the favorite's price
column 24 of FIG. 2 are shown in row format in FIG. 3 at 40.
The strike prices function as calibration constants, the
range of which is empirically determined based on the
20   probable volatility of scoring in the game. Although it is
within the scope of the present invention to provide strike
prices in one point increments, to do so would result in a
potentially unmanageable number of options (from a player's
prospective). Similarly, too coarse a strike price
25   increment would result in options that were too insensitive
to the movement of the market. Accordingly, in the
embodiment of FIG. 2, since a basketball game is generally
scored in 2 point increments, strike price increments are
set at 3 points as a reasonable compromise between
30   sensitivity to the movement of the market and the number of
options necessary for an easily playable game.

The strike price of a "win" is arbitrarily set at $100
with the remaining strike prices set at $100 plus or minus
the particular strike price increment. In the case of
35   winning by an excess amount the strike prices are set at

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$100 plus the strike price increment and, in the case of
losing by less than a set amount, the strike prices are set
at $100 minus the strike price increment. Thus, the strike
price for the favorite to "win by more than three" is $103,
5   "win by more than six" is $106, etc. Similarly the strike
price for the favorite to "lose by less than three" is $97,
"lose by less than 6" is $94, etc.

The score index 42 is analogous to the current value of
the underlying commodity of an option and is calculated
10 according to the formula:

IX = 100 + (FS-US);

where IX is the index for a particular option, FS is
the favorite's current score and US is the underdog's
current score. As shown in FIG. 3, where play has not
15 begun, FS-US is zero and the index is equal to 100.

The "in/out of the money" calculation ("I/O") is the
equivalent of the intrinsic value of a real-life option,
except that the signs are reversed. A option that is in the
money shows up as having a negative "I/O" value and an
20 option that is out of the money shows up as having a
positive I/O value. The value of the I/O variable in the
game is equal to the strike price of each option minus the
index (i.e., strike price minus the value of the commodity).
Thus, where the score index exceeds the strike price of an
25 option on the favorite, the option holder is in the money.
Where the strike price of an option on the favorite exceeds
the score index, the option holder is out of money. (In
this regard, the holder of options on the favorite is
analogous to a futures trader holding "call" options. The
30 greater the magnitude by which the index (value of the
commodity) exceeds the strike price (settlement price), the
greater the value of the call option.)

The strike prices appearing in the underdog's price
column 26 of FIG. 2 are shown in row format in FIG. 4 at 50.
35 As with the favorite's strike prices, the underdog's strike

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prices function as calibration constants and move in
increments that are the same as the favorite's strike price
increments. The strike price of a "win" is set at $100 with
the remaining strike prices set at $100 plus or minus the

5   particular strike price increment. In the case of losing by
less than a set amount, the strike prices are set at $100
plus the particular strike price increment and, in the case
of winning by an excess amount, the strike prices are set at
$100 minus the strike price increment. (Note that this is

10 the opposite of the favorite's strike price formula). Thus,
the strike price for the underdog to "win by more than
three" is $97, "win by more than six" is $94, etc.
Similarly the strike price for the underdog to "lose by less
than three or win" is $103, "lose by less than 6 or win" is

15 $106, etc.

        The score index 52 is the same as the index used in the
favorite's calculations.

            IX = 100 + (FS-US);

        where IX is the index for a particular option, FS is

20 the favorite's current score and US is the underdog's
current score.   The value of the "in/out of the money"
variable is equal to the index minus the strike price of
each option (the opposite of the favorite's I/O
calculation). Thus, where the score index exceeds the

25 strike price of an option on the underdog, the option holder
is out of the money. Where the strike price of an option on
the underdog exceeds the score index, the option holder is
in the money. (In this regard, the holder of options on the
underdog is analogous to a futures trader holding "put"

30 options. The greater the magnitude by which the strike
price (settlement price) exceeds the index (value of the
commodity) the greater the value of the put option.) As can
be seen from the foregoing discussion, in the preferred
embodiment of FIG. 2, the intrinsic value of the options are

35 based predominantly on the current score of the sporting

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event. However, it is within the scope of the present
invention to model a market based on other parameters
characteristic to a particular sporting event, such as the
total number of points scored by all participants, the
5   interval between participants (in a race), the number of
hits, or shots on goal, or any other quantifiable parameter
for determining the progress of a sporting event or the
relative progress of its participants. Thus, as used
herein, "score" means any quantifiable representation of the
10   progress of a competitive event.

        The foregoing method for calculating intrinsic value of
an array of options for the purpose of an options trading
game represents a substantial improvement over prior art
games, by providing a simulated market that is based on a
15   real, rather than a purely random event. Such a game, based
only on the intrinsic value of the options would be suitable
for play as a beginner's game. A most preferred embodiment
of the present invention, however, includes a further
refinement -- that of simulating the time value that the
20   market would place on a particular option and calculating a
premium based on the time value.

        With reference to FIG. 3, the time decay factor 46 for
the favorite is equal to the original point spread
multiplied by the ratio of minutes remaining in the game
25   divided by the total length of the game, or expressed as a
formula:

            $TD = IPS \times (TR/TT);$

        where TD is the time decay factor, IPS is the initial
point spread, TR is the time remaining and TT is the total
30   length of the game.

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The accuracy formula factor 48 is a weighted multiplier equal to the 0.01 multiplied by the index multiplied by the time decay factor, or expressed as a formula:

$$AF= 0.01 \ (IX) \ x \ (TD)$$

5   where AF is the accuracy factor, IX is the index and TD is the time decay factor calculated above. Thus, the favorite's accuracy factor is a measure of the percentage of the game remaining weighted by the original point spread. Where used, the accuracy factor provides a weighted straight
10   line depreciation of the time value of the options as the game progresses.

The final trading price 49 of a particular favorite's option is adjusted by one of two time dependent multipliers: the time decay factor or a time value multiplier. Which of
15   the two time dependent multipliers is used is determined by a series of screens based on the result of the I/O calculation. If the I/O variable is zero or a negative number, indicating the option is at or in the money, the trading price "P" is simply equal to the index minus the
20   strike price plus the time decay factor -- which is the same as the intrinsic value of the option (-I/O) plus the time decay factor:

$$P = IX - SP + TD = -(I/O) + TD$$

For all values of the in/out variable ("I/O") that are
25   greater than zero (out of the money), the trading price is equal to the accuracy factor multiplied by the time value multiplier. If the I/O variable is greater than 0 and less than or equal to 2 (i.e. out of the money by less than $2) the time value multiplier is set equal to 0.8 and the
30   trading price of the option is equal to 80% of the accuracy factor. If I/O is greater than 2 and less than or equal to 5 (i.e. out of the money by $2-5), the trading price of the option is equal to 60% of the accuracy factor. If I/O is greater than 5 and less than or equal to 8, the trading
35   price of the option is equal to 35% of the accuracy factor.

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If I/O is greater than 8 and less than or equal to 11, the
trading price of the option is equal to 15% of the accuracy
factor. If I/O is greater than 11 and less than or equal to
14, the trading price of the option is equal to 5% of the
5   accuracy factor. If I/O is greater than 14, the trading
price of the first option greater than 14 is set equal to
$.10 (irrespective of the intrinsic value of the option) and
the price of the remaining options greater than 14 are set
to zero (out of range). Options with a purchase price of
10   zero cannot be purchased.

As can be seen from FIG. 3, an option on the favorite
to lose by less than 3 or win has a strike price of $97.
The index at the beginning of the game is always 100,
because the score is always tied at the beginning of a game.
15   Thus, according to the I/O formula, the lose by less than 3
option is in the money by $3 (the intrinsic value of the
option). Because the ratio of time remaining to total time
is equal to unity at the beginning of a game, the result of
the favorite's time decay formula at the beginning of the
20   game is always equal to the initial point spread.
Similarly, because the index is always 100 at the beginning
of a game, and 0.01 x 100 is equal to unity, the result of
the accuracy factor at the beginning of a game is always
equal to the time decay value. Thus, at the beginning of a
25   game having a point spread of 5, a favorite's option that is
in the money by $3 at the beginning of the game will have a
price of $8 (the initial point spread plus the intrinsic
value of the option).

With reference to FIG. 4, the time decay factor 56 for
30   the underdog is equal to simply the ratio of minutes
remaining in the game divided by the total length of the
game, without an adjustment for the point spread, or
expressed as a formula:

$$TD = (TR/TT);$$

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where TD is the time decay factor, TR is the time
remaining and TT is the total length of the game.

As with the favorite's options calculations, the
accuracy formula factor 58 for the underdog is a weighted
5   multiplier equal to the 0.01 multiplied by the index
multiplied by the time decay factor, or expressed as a
formula:

$$AF= 0.1 \ (IX) \ x \ (TD)$$

where AF is the accuracy factor, IX is the index and TD
10 is the time decay factor calculated above. Thus, where
used, the underdog's accuracy factor provides an unweighted
straight line depreciation of the time value of the options
as the game progresses.

The final trading price 59 of the underdog options are
15 also adjusted by one of two time dependent multipliers: The
time decay factor or a time value multiplier. Which of the
two time dependent multipliers is used is determined by a
series of screens based on the result of the in/out of the
money variable. If the in/out variable is zero or a
20 negative number, indicating the option is at or in the
money, the trading price "P" is simply equal to the strike
price minus the index plus the time decay factor -- which is
the same as the intrinsic value of the option (-I/O) plus
the time decay factor:

25       $$P = SP - IX + TD = -(I/O) + TD$$
For all values of the I/O variable that are greater than
zero (out of the money), the trading price is equal to the
accuracy factor multiplied by the time value multiplier. If
the I/O variable is greater than 0 and less than or equal to
30 2, the time value multiplier is set equal to 0.7 and, the
trading price of the option is equal to 70% of the accuracy
factor. If I/O is greater than 2 and less than or equal to
5, the trading price of the option is equal to 50% of the
accuracy factor. If I/O is greater than 5 and less than or
35 equal to 8, the trading price of the option is equal to 30%

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of the accuracy factor. If I/O is greater than 8 and less
than or equal to 11, the trading price of the option is
equal to 10% of the accuracy factor. If I/O is greater than
11 and less than or equal to 14, the trading price of the
5   option is equal to 3% of the accuracy factor. If I/O is
greater than 14, the trading price of the first option
greater than 14 is set equal to $.10 and the price of the
remaining options greater than 14 are set to zero (out of
range). Options with a purchase price of zero cannot be
10   purchased.

As can be seen from FIG. 4, for example, an option on
the underdog to win by more than 3 has strike price of $97.
As discussed above, the index at the beginning of the game
is always $100, because the score is always tied at the
15   beginning of a game. Thus, according to the I/O formula,
the win by more than 3 option is out of the money by $3
(i.e. it has negative intrinsic value). Because the ratio
of time remaining to total time is equal to unity at the
beginning of a game, the result of the time decay formula
20   for the underdog at the beginning of the game is always
equal to one. Similarly, because the index is always $100
at the beginning of a game, and 0.01 x 100 is equal to
unity, the result of the accuracy factor at the beginning of
a game is always equal to the time decay value. Thus, at
25   the beginning of a game an underdog option that is out of
the money by $3 at the beginning of the game will have a
price of $.50 (equal to the accuracy factor (1) multiplied
by 0.5, (the time value multiplier for an option that is out
of the money by $2-5)).

30   The values of the time value multipliers, and the
ranges to which each of the multipliers apply, as described
in the preferred embodiment, are empirically determined.
Generally, however, the further an option is out of the
money, the less likely it is that the option will have
35   intrinsic value at the end of the game and, therefore, the

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less expensive it must be. Therefore, the limits on the
time value multipliers are that they must be less than one
(to prevent an out of the money option from being more
costly than an in the money option) and they must be in
5   descending order (to prevent an option that is further out
of the money from being more costly than an option that is
less out of the money). Accordingly, within the scope of
the present invention, each of the time value multipliers
could be from 0 to .99, provided the above criteria is met.
10   Alternatively, the time value multipliers could be adjusted
by a linear formula rather than a series of screens, or by a
fuzzy logic program responsive to the trading activity. The
magnitude of the multipliers discussed in the preferred
embodiment provided sufficient discrimination to make a
15   playable game, without excessive programming complexity.

Preferably, the host computer permits trading to take
place before the beginning of the sporting event, during
time outs, and during other breaks in the action, thus
enabling the players to buy and sell their options
20   throughout the event, yet still enjoy viewing the sporting
event itself.

FIG. 5 depicts a player terminal display late in the
third quarter of the simulated basketball game. The time
remaining 20 is 16 minutes and the underdog team B is
25   currently leading by 5 points. As can be seen from a
comparison of FIG. 5 with FIG. 2, a feature of the present
invention is that as out-of-range options accumulate due to
a wide disparity in score or other factors, the out-of-range
options roll off the screen and are replaced with new
30   options appearing at the opposite end of the field.

FIG. 6 shows the calculations for the favorite's
options. With reference to FIG. 6, the index 42 is now $95.
Thus the intrinsic value of an option on the favorite to
lose by less than three or win is -$2 (down from $8 at the
35   beginning). The time decay multiplier is 1.666667 -- the

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point spread multiplied by the ratio of time remaining to
total time, i.e. 5 x (16/48). The accuracy factor is
1.583333 -- 0.01 multiplied by the index multiplied by the
time decay multiplier, i.e. 0.01 x ($95) x (1.66667). Since
5   the option is out of the money by $2, the final trading
price of the option at this point is the accuracy factor
multiplied by the time value multiplier for the range of $0-
2 (i.e. 1.5833333 x 0.8 = 1.2667 = $1.30 rounded to the
nearest $.10). $1.30 represents an 87% loss from the
10   original price of $8.00.
          FIG. 7 shows the calculations for the underdog options.
The index 52 is still $95. Thus, the intrinsic value of an
option on the underdog winning by more than three is $2 (up
from $.50 at the beginning of the event). The time decay
15   multiplier is .3333333 -- the ratio of time remaining to
total time (i.e. 16/48). The accuracy factor is .316777 --
0.01 multiplied by the index multiplied by the time decay
multiplier, i.e 0.01 x ($95) x (.333333). Since the option
is in money, the trading price of the option is the
20   intrinsic value plus the time decay multiplier i.e. $2 +
$.31677, or $2.30 rounded to the nearest $.10). $2.30
represents a 460% increase over the original price of $.50.
          In another embodiment of the present invention, instead
of the market being simulated predominantly by the
25   difference between the scores of the two teams in the
basketball game, the market is simulated by the total score
of the two teams. FIG. 8 shows an exemplary player's
terminal display in a game based on the same sporting event
as the embodiment of FIG. 2, with team A 16 and team B 18
30   playing. As with FIG. 2, the game begins with no score and
remaining time 20 of 48 minutes. Instead of favorite and
underdog options, however, the commodities options available
in the game of FIG. 8 are options on whether the total
points scored will exceed or fall short of a preselected
35   point total.

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The "over" options available for purchase as indicated
in FIG. 8 range from an option 70 on the total points scored
exceeding 160 to an option 72 on the total points scored
exceeding 240 points. The score over 160 points option has
5   a strike price of 160 and a price of $50.00. The score over
240 points option has a strike price of 240 and a price of
$.10. Since a typical basketball game averages about 200
total points, it is highly likely that at least 160 points
will be scored. Accordingly, the "score over 160 points"
10 option has a high price. Similarly, it is moderately
unlikely that more than 240 points will be scored.
Accordingly, the "score more than 240 points" option is
fairly inexpensive.

The "under" options available for purchase as indicated
15 in FIG. 8 range from an option 74 on the total points scored
falling short of 160 to an option 76 on the total points
scored falling short of 240 points. The score under 160
points option has a strike price of $160 and a price of
$.10. The score under 240 points option has a strike price
20 of 240 and a price of $50.00. Since, as discussed above, a
typical basketball game averages about 200 total points, it
is highly unlikely that fewer than 160 points will be
scored. Accordingly, the "score under 160 points" option
has a low price. Similarly, it is highly probable that
25 fewer than 240 points will be scored. Accordingly, the
"score under 240 points" option is fairly expensive.

The "over" strike prices appearing in FIG. 8 are shown
in row format in FIG. 9 at 80. The target score "TS" is
empirically determined based on the average points likely to
30 be scored in a particular game. As in the favorite/underdog
game, the strike prices function as calibration constants,
the range and increments of which are empirically determined
based on a compromise between sensitivity to scoring and
keeping the number of options to a manageable size. In the

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embodiment of FIG. 8, the strike price increment is set to
$10.

The index **82** is a straight line extrapolation of the
points scored during the time played thus far extrapolated
5   to the end of the game. The index is equal to the total
points scored in the game thus far divided by the time
played thus far multiplied by the total time of the game, or
expressed as a formula:

$$IX = TT \times (FS+US)/(TT-TR)$$

10   where IX is the index, TT is the total time for
regulation play, TR is the time remaining, FS is the
favorite's score, and US is the underdog's score. At the
beginning of the game, there is no data from which to
extrapolate a predicted final score. Accordingly, at the
15 start of the game, the index is simply set to the
empirically determined target score TS.

The in/out of the money calculation **84** is equal to the
strike price minus the Index (SP-IX). The time decay
formula is a straight ratio of the time remaining over the
20 total time, multiplied by a scale factor of 10, _i.e_

$$TD = 10 \ (TR/TT)$$

where TD is the time decay factor, TR is the time
remaining and TT is the total time of the game.

The accuracy factor is calculated as follows:

25      $$AF = 0.01 \ (IX) \times (TD)$$

where AF is the accuracy factor, TD is the time decay
factor, and IX is the index.

Finally the trading prices for the options **89** are
adjusted by one of two time dependent multipliers: the time
30 decay factor or a time value multiplier. Which of the two
multipliers is used is determined by a series of screens
based on the result of the in/out of the money variable. If
the in/out variable is zero or negative, indicating the
option is at or in the money, the trading price "P" is
35 simply equal to the index minus the strike price plus the

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time decay factor -- which is the same as the intrinsic
value of the option (-I/O) plus the time decay factor:

$$P = IX - SP + TD = -(I/O) + TD$$

For all values of the in/out variable ("I/O") that are
5   greater than zero (out of the money), the trading price is
equal to the accuracy factor multiplied by the time value
multiplier. If the I/O variable is greater than 0 and less
than or equal to 2, (out of the money by less than $2) the
time value multiplier is set equal to 0.9 and, the trading
10   price of the option is equal to 90% of the accuracy factor.
If I/O is greater than 2 and less than or equal to 9 (out of
the money by $2-9), the time value multiplier is equal to
.65 and the trading price of the option is equal to 65% of
the accuracy factor. If I/O is greater than 9 and less than
15   or equal to 19, the trading price of the option is equal to
28% of the accuracy factor. If I/O is greater than 19 and
less than or equal to 29, the trading price of the option is
equal to 8% of the accuracy factor. If I/O is greater than
29 and less than or equal to 39, the trading price of the
20   option is equal to 2% of the accuracy factor. If I/O is
greater than 39, the trading price of the first option
greater than 39 is set equal to $.10 and the price of the
remaining options greater than 39 are set to zero (out of
range). As with the favorite/underdog game, options with a
25   purchase price of zero cannot be purchased.

The "under" option strike prices appearing in FIG. 8
are shown in row format in FIG. 10 at 90. The index 92 for
the under options is the same as the index for the "over"
options. The in/out of the money calculation for the
30   "under" options is the negative of the "over" option, namely
the index minus the strike price. The time decay, accuracy
factor, and final price are all calculated in the same
manner as the time decay, accuracy factor, and final price
for the "over options"

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As can be seen with reference to FIGs. 11, 12 and 13, which depict the same moment in time as FIGs. 5, 6 and 7, the index is 217.5, indicating that the extrapolated score will exceed the 200 point target score. Accordingly, an

5   "over" option that the score will be over 210 has a price of $10.80 (a 380% increase over the $2.80 price at the beginning). However, an "under" option that the score would be under 210 has a price of $4.70 (less than 24% of the original price of $20.00). Fig. 14 and 15 depict exemplary

10   player's screens at the end of the game at which time the options are traded into the host and the winner determined based on which player accumulated the most simulated wealth.

As with the favorite/underdog game, the players attempt to time their buying and selling of options in response to

15   the movement of the simulated market, in order to maximize profits and accumulate the most wealth. At the end of the sporting event, the player that has amassed the most wealth is declared the winner.

For simplicity's sake in the description, the values

20   inputted into the variables for current score, total time, time remaining and other values derived from the sporting event are described as being "equal" to the actual values of those parameters. Obviously, all of the variables are scalable. Therefore, as long as the values derived from the

25   sporting event are proportional to the actual values, the sporting event will provide appropriate basis from which to simulate a market consistent with the present invention. Accordingly, for the purpose of interpreting the claims, where a variable that is inputted is stated as being "equal

30   to" the current score, total time, time remaining, or any other external variable relating to the particular sporting event being used as the basis for simulating the definition also includes "proportional to" that value.

Although certain preferred embodiments and methods have

35   been disclosed herein, it will be apparent from the

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foregoing disclosure to those skilled in the art that
variations and modifications of such embodiments and methods
may be made without departing from the true spirit and scope
of the invention. For example, consistent with the use of
5   "score" herein meaning any quantifiable indication of the
progress of a competition, sporting events that do not have
a score in points, but have a winner based on elapsed time,
or based on the first to cross a finish line, such as in a
sailboat race, may be used to model the market in accordance
10   with the present invention. As discussed with reference to
FIGs. 8-13 the market can be modeled based on total points
accumulated by both teams rather than the scores of both.
Similarly, the market can be modeled based on parameters
that do not determine the winner of an event, such as the
15   number of hits or errors in a baseball game. Accordingly,
it is intended that the invention shall be limited only to
the extent required by the appended claims and the rules and
principles of applicable law.

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What is claimed is:

1   1.   A sports options trading game that uses a sporting
2   event as a basis for simulating a market and is playable by
3   a plurality of players each having data terminal, said game
4   comprising:
5   means for allocating to each of said plurality of
6   players a predetermined sum of simulated money displayed as
7   a field on said data terminal;
8   means for providing an array of simulated
9   commodities options available for purchase, said options
10   being displayed as a plurality of fields on said data
11   terminals;
12   means responsive to said sporting event for
13   calculating a plurality of intrinsic option prices based on
14   values comprising a plurality of predetermined option strike
15   prices and a current score in said sporting event;
16   means for displaying said intrinsic option prices
17   on said data terminals;
18   means for providing each player with an
19   opportunity to buy and sell said options at said intrinsic
20   option prices by inputting information into said data
21   terminal, wherein said players attempt to accumulate the
22   most simulated wealth by buying and selling said options at
23   favorable prices as said prices fluctuate in response to
24   said progress of said sporting event; and
25   means for terminating the game when said sporting
26   event ends and determining a winner of said game.

1   2.   The sports options trading game of claim 1 further
2   including:
3   means for calculating a time dependent multiplier
4   for said options; and
5   means for adjusting said plurality of intrinsic
6   option prices based on said time dependent multiplier to
7   arrive at a plurality of final option prices.

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1   3.   The sports options trading game of claim 2 wherein
2   said sporting event includes a favorite and an underdog
3   participant and wherein said means for calculating said time
4   dependent multiplier for said favorite comprises a computer
5   executable algorithm that is a function of a plurality of
6   sporting event indexed values, said sporting event indexed
7   values comprising an initial point spread, a time remaining
8   figure, and a total time figure, said initial point spread
9   having a value equal to a point spread determined from said
10   preselected sporting event, said total time figure having a
11   value equal to the total time of the preselected sporting
12   event, and said time remaining figure having a value equal
13   to the time remaining in said preselected sporting event.

1   4.   The sports options trading game of claim 3 wherein
2   said sporting event indexed values further include an
3   empirically determined multiplier the value of which is
4   selected based on said intrinsic option prices.

1   5.   The sports options trading game of claim 2 wherein
2   said sporting event includes a favorite and an underdog
3   participant and wherein said means for calculating said time
4   value for said underdog comprises a computer executable
5   algorithm that is a function of a plurality of sporting
6   event indexed values, said sporting event indexed values
7   comprising an initial point spread, a time remaining figure,
8   and a total time figure, said initial point spread having a
9   value equal to a point spread determined from said
10   preselected sporting event, said total time figure having a
11   value equal to the total time of the preselected sporting
12   event, and said time remaining figure having a value equal
13   to the time remaining in said preselected sporting event.

1   6.   The sports options trading game of claim 5 wherein
2   said sporting event indexed values further include an

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3   empirically determined multiplier the value of which is
4   selected based on said intrinsic option prices.

1   7.   The sports options trading game of claim 1 wherein
2   said score comprises the points scored by a participant in
3   said sporting event.

1   8.   The sports options trading game of claim 1 wherein
2   said score comprises an aggregate of points scored by all
3   participants in said sporting event.

1   9.   The sports options trading game of claim 1 wherein
2   said sporting event comprises a basketball game and said
3   incidents in said sporting event comprise a current score,
4   the total length of time in a basketball game for regulation
5   play and the time remaining in regulation play.

1   10.   The sports options trading game of claim 1 wherein
2   said sporting event comprises a football game and said
3   incidents in said sporting event comprise a current score,
4   the total length of time in a football game for regulation
5   play and the time remaining in regulation play.

1   11.   The sports options trading game of claim 1 wherein
2   said sporting event comprises a baseball game and said
3   incidents in said sporting event comprise a current score,
4   the total number of innings in a baseball game for
5   regulation play and the number of innings remaining in
6   regulation play.

1   12.   The sports options trading game of claim 1 wherein
2   said sporting event comprises a sailboat regatta and said
3   incidents in said sporting event comprise the lead time held
4   by the leading boat, the total number of buoys to be rounded

5 in a regulation race and the number of buoys to be rounded
6 in a race.

1   13.   The sports options trading game of claim 1 wherein
2 said sporting event comprises a golf game and said incidents
3 in said sporting event comprise the number of strokes for a
4 predetermined golfer and the number of holes left to play.

1   14.   The sports options trading game of claim 2 wherein
2 said score comprises the points scored by a participant in
3 said sporting event.

1   15.   The sports options trading game of claim 2 wherein
2 said score comprises an aggregate of points scored by all
3 participants in said sporting event.

1   16.   The sports options trading game of claim 2 wherein
2 said sporting event comprises a basketball game and said
3 incidents in said sporting event comprise a current score,
4 the total length of time in a basketball game for regulation
5 play and the time remaining in regulation play.

1   17.   The sports options trading game of claim 2 wherein
2 said sporting event comprises a football game and said
3 incidents in said sporting event comprise a current score,
4 the total length of time in a football game for regulation
5 play and the time remaining in regulation play.

1   18.   The sports options trading game of claim 2 wherein
2 said sporting event comprises a baseball game and said
3 incidents in said sporting event comprise a current score,
4 the total number of innings in a baseball game for
5 regulation play and the number of innings remaining in
6 regulation play.

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1   19. A method of playing an options trading game using
2 a sporting event as a basis for simulating a market and
3 playable by a plurality of players each having data
4 terminal, said method comprising:
5   allocating to each of said plurality of players a
6 predetermined sum of simulated money displayed as a field on
7 said data terminal;
8   providing an array of options available for
9 purchase, said options being displayed as a plurality of
10 fields on said data terminals;
11   inputting into a host computer a plurality of
12 option strike prices each having a predetermined value;
13   inputting a score into said host computer, said
14 score having a value equal to a current score in a
15 preselected sporting event;
16   calculating a plurality of intrinsic option prices
17 based on values comprising said plurality of predetermined
18 option strike prices and said current score in said sporting
19 event, said option prices being displayed as a plurality of
20 fields on said data terminals corresponding to said options
21 available for purchase;
22   providing each player with an opportunity to buy
23 and sell said options at said option prices by inputting
24 information into said data terminal, wherein said players
25 attempt to accumulate the most simulated wealth by buying
26 and selling said options at favorable prices as said prices
27 fluctuate in response to said sporting event;
28   terminating the game when said preselected
29 sporting event ends.

1   20. The method of claim 19 further including:
2   calculating a time dependent multiplier for said
3 options; and

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4   adjusting said plurality of intrinsic option
5   prices based on said time dependent multiplier to arrive at
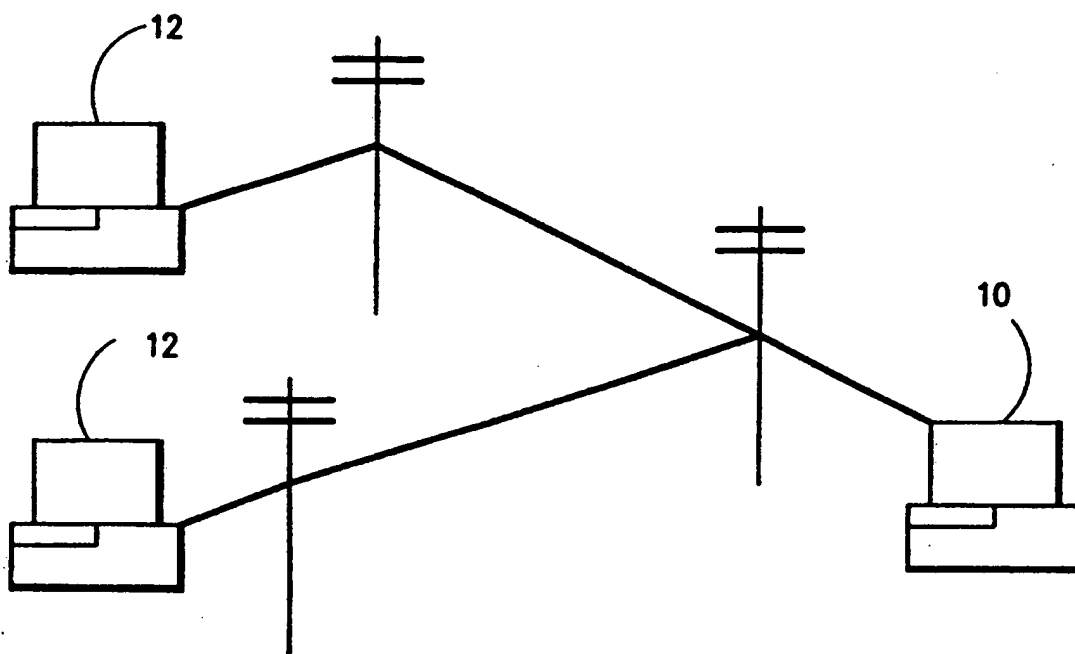6   a plurality of final option prices.

FIG. 1

FIG. 2

FIG. 3

SCREEN PRINT #1
INPUTS:
FAVORITE'S SCORE   0
UNDERDOG'S SCORE   0
MINUTES LEFT   48
POINT SPREAD   5
SET OVER UNDER   200

FAVORITE'S OPTIONS:	LESS UNDER 12 OR TIE	LOSS UNDER 9 OR TIE	LOSS UNDER 6 OR TIE	LOSS UNDER 3 OR TIE	WIN BY 1 OR MORE	WIN BY MORE THAN 3	WIN BY MORE THAN 6	WIN BY MORE THAN 9	WIN BY MORE THAN 12
40 STRIKE PRICE	88	91	94	97	100	103	106	109	112
EXPLANATION OF FORMULA TO CALCULATE INDEX	FAVORITE'S SCORE MINUS UNDERDOG'S SCORE PLUS 100 (EXPLANATION IS SAME FOR ALL STRIKE PRICES)								
42 RESULT OF INDEX CALCULATION	100	100	100	100	100	100	100	100	100
EXPLANATION OF IN/ OUT OF THE MONEY	STRIKE PRICE MINUS THE INDEX (EXPLANATION IS THE SAME FOR ALL STRIKE PRICES)								
44 RESULT OF IN/OUT OF MONEY FORMULA	-12	-9	-6	-3	0	3	6	9	12
EXPLANATION OF FORMULA TO CALCULATE THE DECAY ON POINT SPREAD	POINT SPREAD MULTIPLIED BY MINUTES LEFT DIVIDED BY TOTAL MINUTES IN PRO BASKETBALL GAME WHICH IS 48 (SAME FOR ALL STRIKE)								
46 RESULT OF TIME DECAY ON POINT SPREAD	5	5	5	5	5	5	5	5	5
EXPLANATION OF ACCURACY FACTOR	RESULT OF TIME DECAY ON POINT SPREAD MULTIPLIED BY RESULT OF INDEX CALCULATION MULTIPLIED BY .01 (SAME FOR ALL STRIKE)								
48 RESULT OF ACCURACY FACTOR FORMULA	5	5	5	5	5	5	5	5	5
49 EXPLANATION OF FINAL PRICE CALCULATION	(EXPLANATION IS SAME FOR ALL STRIKE PRICES)								

IF RESULT OF IN/OUT IS EQUAL TO OR LESS THAN ZERO THEN TAKE RESULT OF INDEX MINUS STRIKE PRICE PLUS RESULT OF THE DECAY ON POINT SPREAD
IF RESULT OF IN/OUT IS GREATER THAN ZERO AND LESS THAN OR EQUAL TO 2 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .8
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 2 AND LESS THAN OR EQUAL TO 5 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .6
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 5 AND LESS THAN OR EQUAL TO 8 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .35
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 8 AND LESS THAN OR EQUAL TO 11 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .15
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 11 AND LESS THAN OR EQUAL TO 14 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .05
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 14 AND MAKE ALL HIGHER STRIKE PRICES EQUAL ZERO

RESULT IS CURRENT PRICE (ROUNDED)	17.0	14.0	11.0	8.0	5.0	3.0	1.0	0.8	0.3

FIG. 4

SCREEN PRINT #1
INPUTS:
FAVORITE'S SCORE   0
UNDERDOG'S SCORE   0
MINUTES LEFT   48
POINT SPREAD   5
SET OVER UNDER   200

UNDERDOG'S OPTIONS:	WIN BY MORE THAN 12	WIN BY MORE THAN 9	WIN BY MORE THAN 6	WIN BY MORE THAN 3	WIN BY 1 OR MORE	LOSE UNDER 3 OR WIN	LOSE UNDER 6 OR WIN	LOSE UNDER 9 OR WIN	LOSE UNDER 12 OR WIN
50 — STRIKE PRICE	88	91	94	97	100	103	106	109	112
52 — EXPLANATION OF FORMULA TO CALCULATE INDEX	FAVORITE'S SCORE MINUS UNDERDOG'S SCORE PLUS 100 (EXPLANATION IS SAME FOR ALL STRIKE PRICES)								
RESULT OF INDEX CALCULATION	100	100	100	100	100	100	100	100	100
54 — EXPLANATION OF IN/OUT OF THE MONEY	INDEX MINUS THE STRIKE PRICE (EXPLANATION IS THE SAME FOR ALL STRIKE PRICES)								
RESULT OF IN/OUT OF MONEY FORMULA	12	9	6	3	0	-3	-6	-9	-12
56 — EXPLANATION OF FORMULA TO CALCULATE THE DECAY ON POINT SPREAD	MINUTES LEFT DIVIDED BY TOTAL MINUTES IN PRO BASKETBALL GAME WHICH IS 48				(SAME FOR ALL STRIKE)				
RESULT OF THE DECAY ON POINT SPREAD	1	1	1	1	1	1	1	1	1
58 — EXPLANATION OF ACCURACY FACTOR FORMULA	RESULT OF TIME DECAY ON POINT SPREAD MULTIPLIED BY RESULT OF INDEX CALCULATION MULTIPLIED BY .01 (SAME FOR ALL STRIKE)								
RESULT OF ACCURACY FACTOR FORMULA	1	1	1	1	1	1	1	1	1

59 — EXPLANATION OF FINAL PRICE CALCULATION

(EXPLANATION IS SAME FOR ALL STRIKE PRICES)

IF RESULT OF IN/OUT IS EQUAL TO OR LESS THAN ZERO THEN TAKE RESULT OF STRIKE PRICE MINUS RESULT OF THE DECAY ON POINT SPREAD
IF RESULT OF IN/OUT IS GREATER THAN ZERO AND LESS THAN OR EQUAL TO 2 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .7
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 2 AND LESS THAN OR EQUAL TO 5 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .5
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 5 AND LESS THAN OR EQUAL TO 8 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .3
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 8 AND LESS THAN OR EQUAL TO 11 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .1
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 11 AND LESS THAN OR EQUAL TO 14 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .03
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 14 MAKE THE ALL HIGHER STRIKE PRICES EQUAL ZERO

RESULT IS CURRENT PRICE (ROUNDED)	0.0	0.1	0.3	0.5	1.0	4.0	7.0	10.0	13.0

═══ Player Game ═══

═══ Results ═══

		Point Spread : 5.0
A	70	Set Over Und : 200
B	75	Total Points : 145
	16	

(Minutes Left)   — 20

═══ Current Holdings ═══

Current Balance 1000.00

Shrs	Price	ID	F/U	Value

Net Worth $ 1000.00

═══ Prices ═══

Favorites Price   : A

Lose under 18 or Win	--|-- 82	14.7
Lose under 15 or Win	--|-- 85	11.7
Lose under 12 or Win	--|-- 88	8.7
Lose under 9 or Win	--|-- 91	5.7
Lose under 6 or Win	--|-- 94	2.7
Lose under 3 or Win	--|-- 97	1.3
Win by 1 or more	--|-- 100	1.0
Win by more than 3	--|-- 103	0.6
Win by more than 6	--|-- 106	0.2

Underdogs Price   : B

Win by more than 18	--|-- 82	0.0
Win by more than 15	--|-- 85	0.0
Win by more than 12	--|-- 88	0.1
Win by more than 9	--|-- 91	0.2
Win by more than 6	--|-- 94	0.2
Win by more than 3	--|-- 97	2.3
Win by 1 or more	--|-- 100	5.3
Lose under 3 or Win	--|-- 103	8.3
Lose under 6 or Win	--|-- 106	11.3

FIG. 5

FIG. 6

	LOSE UNDER 12 OR WIN	LOSE UNDER 9 OR WIN	LOSE UNDER 6 OR WIN	LOSE UNDER 3 OR WIN	WIN BY 1 OR MORE	WIN BY MORE THAN 3	WIN BY MORE THAN 6	WIN BY MORE THAN 9	WIN BY MORE THAN 12
SCORED POINT F7									
INPUTS:									
FAVORITE'S SCORE 70									
UNDERDOG'S SCORE 65									
MINUTES LEFT 10									
POINT SPREAD 5									
SET OVER UNDER 200									
FAVORITE'S OPTIONS:	88	91	94	97	100	103	106	109	112
FAVORITE'S SCORE MINUS UNDERDOG'S SCORE PLUS 100 (EXPLANATION IS SAME FOR ALL STRIKE PRICES)									
STRIKE PRICE	95	95	95	95	95	95	95	95	95
EXPLANATION OF FORMULA TO CALCULATE INDEX									
RESULT OF INDEX CALCULATION	-7	-4	-1	2	5	8	11	14	17
STRIKE PRICE MINUS THE INDEX (EXPLANATION IS THE SAME FOR ALL STRIKE PRICES)									
EXPLANATION OF IN/OUT OF THE MONEY									
RESULT OF IN/OUT OF MONEY FORMULA	-7	-4	-1	2	5	8	11	14	17
POINT SPREAD MULTIPLIED BY MINUTES LEFT DIVIDED BY TOTAL MINUTES IN PRO BASKETBALL GAME WHICH IS 48 (SAME FOR ALL STRIKE)									
EXPLANATION OF FORMULA TO CALCULATE THE DECAY ON POINT SPREAD									
RESULT OF THE DECAY ON POINT SPREAD	1.66666667	1.66666667	1.66666667	1.66666667	1.66666667	1.66666667	1.66666667	1.66666667	1.66666667
RESULT OF TIME DECAY ON POINT SPREAD MULTIPLIED BY RESULT OF INDEX CALCULATION MULTIPLIED BY .01 (SAME FOR ALL STRIKES)									
EXPLANATION OF ACCURACY FACTOR FORMULA									
RESULT OF ACCURACY FACTOR FORMULA	1.58333333	1.58333333	1.58333333	1.58333333	1.58333333	1.58333333	1.58333333	1.58333333	1.58333333
EXPLANATION OF FULL PRICE CALCULATION									
RESULT IS CURRENT PRICE (ROUNDED)	8.7	5.7	2.7	1.3	1.0	0.6	0.2	0.1	0.0

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FIG. 7

FIG. 8

FIG. 9

SCREEN PRINT #2

INPUTS:
FAVORITE'S SCORE   0
UNDERDOG'S SCORE   0
MINUTES LEFT   48
POINT SPREAD   5
SET OVER UNDER   200

OVER OPTIONS:	OVER 160	OVER 170	OVER 180	OVER 190	OVER 200	OVER 210	OVER 220	OVER 230	OVER 240
80 STRIKE PRICE	160	170	180	190	200	210	220	230	240
EXPLANATION OF FORMULA TO CALCULATE INDEX	IF MINUTES LEFT IS EQUAL TO 48, THEN USE THE SET OVER UNDER NUMBER. (SAME FOR ALL STRIKE PRICES) IF MINUTES LEFT IS LESS THAN 48, TAKE THE SUM OF FAVORITE'S SCORE PLUS UNDERDOG'S SCORE, AND MULTIPLY THAT SUM BY 48 DIVIDED BY THE RESULT OF 48 MINUS MINUTES LEFT. (OR) (FAVORITE'S SCORE PLUS UNDERDOG'S SCORE) MULTIPLIED BY (48/(48 MINUS MINUTES LEFT)								
82 RESULT OF INDEX CALCULATION	200	200	200	200	200	200	200	200	200
EXPLANATION OF IN/ OUT OF THE MONEY	STRIKE PRICE MINUS THE INDEX (EXPLANATION IS THE SAME FOR ALL STRIKE PRICES)								
84 RESULT OF IN/OUT OF MONEY FORMULA	-40	-30	-20	-10	0	10	20	30	40
EXPLANATION OF FORMULA TO CALCULATE THE DECAY ON POINT SPREAD	10 MULTIPLIED BY MINUTES LEFT DIVIDED BY TOTAL MINUTES IN PRO BASKETBALL GAME WHICH IS 48 (SAME FOR ALL STRIKE)								
86 RESULT OF THE DECAY	10	10	10	10	10	10	10	10	10
EXPLANATION OF ACCURACY FACTOR FORMULA	RESULT OF THE DECAY MULTIPLIED BY RESULT OF INDEX CALCULATION MULTIPLIED BY .01 (SAME FOR ALL STRIKE)								
88 RESULT OF ACCURACY FACTOR FORMULA	20	20	20	20	20	20	20	20	20
89 EXPLANATION OF FINAL PRICE CALCULATION	(EXPLANATION IS SAME FOR ALL STRIKE PRICES)								

IF RESULT OF IN/OUT IS EQUAL TO 0 OR LESS THAN ZERO THEN TAKE RESULT OF INDEX MINUS STRIKE PRICE PLUS RESULT OF THE DECAY
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN ZERO AND LESS THAN OR EQUAL TO 2 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .9
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 2 AND LESS THAN OR EQUAL TO 6 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .65
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 6 AND LESS THAN OR EQUAL TO 10 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .28
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 10 AND LESS THAN OR EQUAL TO 29 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .08
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 29 AND LESS THAN OR EQUAL TO 39 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .02
IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 39 MAKE THE RESULT EQUAL .1 AND MAKE ALL HIGHER STRIKE PRICES EQUAL ZERO

RESULT IS CURRENT PRICE (ROUNDED)	50.0	40.0	30.0	20.0	10.0	5.0	1.0	0.4	0.1

FIG. 10

SCREEN PRINT
INPUTS :
FAVORITE'S SCORE 0
UNDERDOG'S SCORE 0
MINUTES LEFT 48
POINT SPREAD 5
SET OVER UNDER 200

90 — UNDER OPTIONS:

	UNDER 160	UNDER 170	UNDER 180	UNDER 190	UNDER 200	UNDER 210	UNDER 220	UNDER 230	UNDER 240
	160	170	180	190	200	210	220	230	240
STRIKE PRICE	160	170	180	190	200	210	220	230	240

EXPLANATION OF FORMULA TO CALCULATE INDEX:
IF MINUTES LEFT IS EQUAL TO 48, THEN USE THE SET OVER UNDER NUMBER. (SAME FOR ALL STRIKE PRICES)
IF MINUTES LEFT IS LESS THAN 48, TAKE THE SUM OF FAVORITE'S SCORE PLUS UNDERDOG'S SCORE, AND MULTIPLY THAT SUM BY 48 DIVIDED BY THE RESULT OF 48 MINUS MINUTES LEFT.
(OR) (FAVORITE'S SCORE PLUS UNDERDOG'S SCORE) MULTIPLIED BY (48/(48 MINUS MINUTES LEFT))

92 — RESULT OF INDEX CALCULATION:

	200	200	200	200	200	200	200	200	200

EXPLANATION OF IN/OUT OF THE MONEY: INDEX MINUS THE STRIKE PRICE (EXPLANATION IS THE SAME FOR ALL STRIKE PRICES)

RESULT OF IN/OUT OF MONEY FORMULA:

	40	30	20	10	0	-10	-20	-30	-40

EXPLANATION OF FORMULA TO CALCULATE TIME DECAY ON POINT SPREAD:
10 MULTIPLIED BY MINUTES LEFT DIVIDED BY TOTAL MINUTES IN PRO BASKETBALL GAME WHICH IS 48 (SAME FOR ALL STRIKE)

RESULT OF TIME DECAY:

	10	10	10	10	10	10	10	10	10

EXPLANATION OF ACCURACY FACTOR FORMULA: RESULT OF THE DECAY MULTIPLIED BY RESULT OF INDEX CALCULATION MULTIPLIED BY .01

RESULT OF ACCURACY FACTOR FORMULA:

	20	20	20	20	20	20	20	20	20

EXPLANATION OF FINAL PRICE CALCULATION:
(EXPLANATION IS SAME FOR ALL STRIKE PRICES)
IF RESULT OF IN/OUT IS EQUAL TO OR LESS THAN ZERO THEN TAKE STRIKE PRICE MINUS RESULT OF INDEX PLUS RESULT OF THE DECAY
IF RESULT OF IN/OUT IS GREATER THAN ZERO AND LESS THAN OR EQUAL TO 2 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .9
IF RESULT OF IN/OUT IS GREATER THAN 2 AND LESS THAN OR EQUAL TO 9 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .65
IF RESULT OF IN/OUT IS GREATER THAN 9 AND LESS THAN OR EQUAL TO 19 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .28
IF RESULT OF IN/OUT IS GREATER THAN 19 AND LESS THAN OR EQUAL TO 29 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .08
IF RESULT OF IN/OUT IS GREATER THAN 29 AND LESS THAN OR EQUAL TO 39 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .02
IF RESULT OF IN/OUT IS GREATER THAN 39 TAKE THE RESULT EQUAL .1 AND MAKE ALL HIGHER STRIKE PRICES EQUAL ZERO

	0.1	0.4	1.8	3.0	5.0	10.0	20.0	30.0	40.0	50.0

RESULT IS CURRENT PRICE (ROUNDED)

Player Game

Results
A   70   Point Spread : 5.0
B   75   Set Over Und : 200
Minutes Left   16   Total Points : 145

Current Holdings
Current Balance   1000.00
Shrs Price   ID   F/U   Value

Net Worth $ 1000.00

Prices

Total Points : 145
Over   160   Points   Total ——→ 160   60.8
Over   170   Points   Total ——→ 170   50.8
Over   180   Points   Total ——→ 180   40.8
Over   190   Points   Total ——→ 190   30.8
Over   200   Points   Total ——→ 200   20.8
Over   210   Points   Total ——→ 210   10.8
Over   220   Points   Total ——→ 220   4.7
Over   230   Points   Total ——→ 230   2.0
Over   240   Points   Total ——→ 240   0.6

Under 160   Points   Total ——→ 160   0.0
Under 170   Points   Total ——→ 170   0.1
Under 180   Points   Total ——→ 180   0.1
Under 190   Points   Total ——→ 190   0.6
Under 200   Points   Total ——→ 200   2.0
Under 210   Points   Total ——→ 210   4.7
Under 220   Points   Total ——→ 220   5.8
Under 230   Points   Total ——→ 230   15.8
Under 240   Points   Total ——→ 240   25.8

FIG. 11

FIG. 12

SCREEN PRINT #8

INPUTS:
- FAVORITE'S SCORE: 75
- UNDERDOG'S SCORE: 70
- MINUTES LEFT: 10
- POINT SPREAD: 5
- SET OVER UNDER: 200

OVER OPTIONS:	OVER 160	OVER 170	OVER 180	OVER 190	OVER 200	OVER 210	OVER 220	OVER 230	OVER 240
STRIKE PRICE	160	170	180	190	200	210	220	230	240

EXPLANATION OF FORMULA TO CALCULATE INDEX:
IF MINUTES LEFT IS EQUAL TO 40, THEN USE THE SET OVER UNDER NUMBER. (SAME FOR ALL STRIKE PRICES)
IF MINUTES LEFT IS LESS THAN 40, TAKE THE SUM OF FAVORITE'S SCORE PLUS UNDERDOG'S SCORE, AND MULTIPLY THAT SUM BY 40
DIVIDED BY THE RESULT OF (40 MINUS MINUTES LEFT).
(OR) (FAVORITE'S SCORE PLUS UNDERDOG'S SCORE) MULTIPLIED BY (40/(40 MINUS MINUTES LEFT))

| RESULT OF INDEX CALCULATION | 217.5 | 217.5 | 217.5 | 217.5 | 217.5 | 217.5 | 217.5 | 217.5 | 217.5 |

EXPLANATION OF IN/OUT OF THE MONEY: STRIKE PRICE MINUS THE INDEX (EXPLANATION IS THE SAME FOR ALL STRIKE PRICES)

| RESULT OF IN/OUT OF MONEY FORMULA | -57.5 | -47.5 | -37.5 | -27.5 | -17.5 | -7.5 | 2.5 | 12.5 | 22.5 |

EXPLANATION OF FORMULA TO CALCULATE THE DECAY OR POINT SPREAD: 10 MULTIPLIED BY MINUTES LEFT DIVIDED BY TOTAL MINUTES IN PRO BASKETBALL GAME WHICH IS 48 (SAME FOR ALL STRIKE)

| RESULT OF TIME DECAY | 3.33333333 | 3.33333333 | 3.33333333 | 3.33333333 | 3.33333333 | 3.33333333 | 3.33333333 | 3.33333333 | 3.33333333 |

EXPLANATION OF ACCURACY FACTOR FORMULA: RESULT OF TIME DECAY MULTIPLIED BY RESULT OF INDEX CALCULATION MULTIPLIED BY .01 (SAME FOR ALL STRIKE PRICES)

| RESULT OF ACCURACY FACTOR FORMULA | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 |

EXPLANATION OF FINAL PRICE CALCULATION (EXPLANATION IS SAME FOR ALL STRIKE PRICES):
IF RESULT OF IN/OUT IS EQUAL TO OR LESS THAN ZERO THEN TAKE RESULT OF INDEX MINUS STRIKE PRICE PLUS RESULT OF THE DECAY
IF RESULT OF IN/OUT IS GREATER THAN ZERO AND LESS THAN OR EQUAL TO 2 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .9
IF RESULT OF IN/OUT IS GREATER THAN 2 AND LESS THAN OR EQUAL TO 6 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .65
IF RESULT OF IN/OUT IS GREATER THAN 6 AND LESS THAN OR EQUAL TO 10 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .28
IF RESULT OF IN/OUT IS GREATER THAN 10 AND LESS THAN OR EQUAL TO 19 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .08
IF RESULT OF IN/OUT IS GREATER THAN 19 AND LESS THAN OR EQUAL TO 39 TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .02
IF RESULT OF IN/OUT IS GREATER THAN 39 MAKE THE RESULT EQUAL ZERO AND MAKE ALL HIGHER STRIKE PRICES EQUAL ZERO

| RESULT IS CURRENT PRICE (ROUNDED) | 60.8 | 50.0 | 40.8 | 30.8 | 20.8 | 10.8 | 4.7 | 2.0 | 0.6 |

FIG. 13

	UNDER 160	UNDER 170	UNDER 180	UNDER 190	UNDER 200	UNDER 210	UNDER 220	UNDER 230	UNDER 240
SCREEN PRINT #8									
INPUTS:									
FAVORITE'S SCORE	75								
UNDERDOG'S SCORE	60								
MINUTES LEFT	10								
POINT SPREAD	5								
SET OVER UNDER	200								
UNDER OPTIONS	UNDER 160	UNDER 170	UNDER 180	UNDER 190	UNDER 200	UNDER 210	UNDER 220	UNDER 230	UNDER 240
STRIKE PRICE	160	170	180	190	200	210	220	230	240
RESULT OF INDEX CALCULATION	217.5	217.5	217.5	217.5	217.5	217.5	217.5	217.5	217.5
RESULT OF IN/OUT OF MONEY FORMULA	57.5	47.5	37.5	27.5	17.5	7.5	-2.5	-12.5	-22.5
RESULT OF TIME DECAY	3.3333333	3.3333333	3.3333333	3.3333333	3.3333333	3.3333333	3.3333333	3.3333333	3.3333333
RESULT OF ACCURACY FACTOR FORMULA	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25
RESULT IS CURRENT PRICE (ROUNDED)	0.0	0.1	0.1	0.8	2.0	4.7	5.8	15.8	25.8

EXPLANATION OF FORMULA TO CALCULATE INDEX: IF MINUTES LEFT IS EQUAL TO 48, THEN USE THE SET OVER UNDER NUMBER. (SAME FOR ALL STRIKE PRICES) IF MINUTES LEFT IS LESS THAN 48, TAKE THE SUM OF FAVORITE'S SCORE PLUS UNDERDOG'S SCORE, AND MULTIPLY THAT SUM BY 48 DIVIDED BY THE RESULT OF 48 MINUS MINUTES LEFT. (OR) (FAVORITE'S SCORE PLUS UNDERDOG'S SCORE) MULTIPLIED BY (48/(48 MINUS MINUTES LEFT))

EXPLANATION OF IN/OUT OF THE MONEY: INDEX MINUS THE STRIKE PRICE (EXPLANATION IS THE SAME FOR ALL STRIKE PRICES)

EXPLANATION OF FORMULA TO CALCULATE TIME DECAY ON POINT SPREAD: 10 MULTIPLIED BY MINUTES LEFT DIVIDED BY TOTAL MINUTES IN PRO BASKETBALL GAME WHICH IS 48 (SAME FOR ALL STRIKE)

EXPLANATION OF ACCURACY FACTOR FORMULA: RESULT OF TIME DECAY MULTIPLIED BY RESULT OF INDEX CALCULATION MULTIPLIED BY .01 (SAME FOR ALL STRIKE PRICES)

EXPLANATION OF FULL PRICE CALCULATION: (EXPLANATION IS SAME FOR ALL STRIKE PRICES) IF RESULT OF IN/OUT IS EQUAL TO OR LESS THAN ZERO THEN TAKE STRIKE PRICE MINUS RESULT OF INDEX PLUS RESULT OF TIME DECAY. IF RESULT OF IN/OUT OF MONEY IS GREATER THAN ZERO AND LESS THAN OR EQUAL TO 2, TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .9. IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 2 AND LESS THAN OR EQUAL TO 6, TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .65. IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 6 AND LESS THAN OR EQUAL TO 10, TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .28. IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 10 AND LESS THAN OR EQUAL TO 29, TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .08. IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 29 AND LESS THAN OR EQUAL TO 99, TAKE RESULT OF ACCURACY FACTOR FORMULA MULTIPLIED BY .02. IF RESULT OF IN/OUT OF MONEY IS GREATER THAN 99 MAKE THE RESULT EQUAL .1 AND MAKE THE STRIKE PRICES EQUAL ZERO.

Player Game

Results
A   105   Point Spread : 5.0
B   94   Set Over Und : 200
Minutes Left 0   Total Points : 199

Current Holdings
Current Balance 1000.00
Shrs Price   ID   F/U   Value

Net Worth $ 1000.00

Prices
Favorites Price : A
Win by more than 6 → 106   5.0
Win by more than 9 → 109   2.0
Win by more than 12 → 112   0.0
Win by more than 15 → 115   0.0
Win by more than 18 → 118   0.0
Win by more than 21 → 121   0.0
Win by more than 24 → 124   0.0
Win by more than 27 → 127   0.0
Win by more than 30 → 130   0.0

Underdogs Price : B
Lose under 6 or Win → 106   0.0
Lose under 9 or Win → 109   0.0
Lose under 12 or Win → 112   1.0
Lose under 15 or Win → 115   4.0
Lose under 18 or Win → 118   7.0
Lose under 21 or Win → 121   10.0
Lose under 24 or Win → 124   13.0
Lose under 27 or Win → 127   16.0
Lose under 30 or Win → 130   19.0

FIG. 14

===== Player Game =====

===== Results =====
A	105	Point Spread : 5.0
B	94	Set Over Und : 200
Minutes Left	0	Total Points : 199

===== Prices =====
Total Points : 199

Over 160	Points Total	→160	39.0
Over 170	Points Total	→170	29.0
Over 180	Points Total	→180	19.0
Over 190	Points Total	→190	9.0
Over 200	Points Total	→200	0.0
Over 210	Points Total	→210	0.0
Over 220	Points Total	→220	0.0
Over 230	Points Total	→230	0.0
Over 240	Points Total	→240	0.0
Under 160	Points Total	→160	0.0
Under 170	Points Total	→170	0.0
Under 180	points Total	→180	0.0
Under 190	Points Total	→190	0.0
Under 200	Points Total	→200	1.0
Under 210	Points Total	→210	11.0
Under 220	Points Total	→220	21.0
Under 230	Points Total	→230	31.0
Under 240	Points Total	→240	41.0

===== Current Holdings =====
Current Balance 1000.00
Shrs Price ID F/U Value

Net Worth $ 1000.00

FIG. 15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/04742

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A63F 9/00

US CL :463/1, 9, 25, 42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 273/278, 297; 364/410, 412; 434/107; 463/1, 9, 22, 25, 40-42

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,378,942 A (ISAAC) 05 April 1983, entire document.	1-20
A	US 4,592,546 A (FASCENDA et al.) 03 June 1986, entire document.	1-20
A	US 5,013,038 A (LUXENBERG et al.) 07 May 1991, entire document.	1-20
A	US 5,018,736 A (PEARSON et al.) 28 May 1991, entire document.	1-20

☐ Further documents are listed in the continuation of Box C.   ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
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"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 MAY 1997	0 5 JUN 1997

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